

FIVE NEW RECORDS OF COMESOMATIDS (NEMATODA, CHROMADORIDA) FROM THE CANARY ISLANDS

R. Riera*¹, J. Núñez² & M.C. Brito²

¹ Centro de Investigaciones Medioambientales del Atlántico (CIMA SL)
Arzobispo Elías Yanes, 44, 38206 La Laguna, Tenerife, Canary Islands, Spain

² Benthos Lab., Department of Animal Biology, Faculty of Biology, University of La Laguna
38206 La Laguna, Tenerife, Canary Islands, Spain

*corresponding author: rodrigo@cimacanarias.com

RESUMEN

Se citan cinco especies de nematodos marinos pertenecientes a la familia Comesomatidae por primera vez para la isla de Tenerife a partir de muestras recolectadas para un estudio ecológico de dos playas arenosas. Las especies fueron *Actarjania* sp. 1, *Actarjania* sp. 2 *Laimella* aff. *longicauda* Cobb, 1920, *Paramesonchium belgium* Jensen, 1976 y *Vasostoma* sp. Las dos primeras fueron determinadas a nivel de género debido a la ausencia de ejemplares en buenas condiciones, mientras que *Vasostoma* sp. estuvo representada únicamente por un fragmento anterior. Se aportan descripciones, figuras y datos merísticos de cada especie.

Palabras clave: Nematoda, Comesomatidae, vida libre, fondos arenosos, Tenerife, islas Canarias.

ABSTRACT

Five species belonging to the family Comesomatidae were recorded in an ecological study of the intertidal sandy seabeds on the south coast of Tenerife. These species were: *Actarjania* sp. 1, *Actarjania* sp. 2 *Laimella* aff. *longicauda* Cobb, 1920, *Paramesonchium belgium* Jensen, 1976 and *Vasostoma* sp. The first two species were determined to genus level due to the lack of material in good conditions and the latter was represented by only one anterior fragment. Descriptions, figures and meristic data of each species are presented.

Key words: Nematoda, Comesomatidae, free-living, sandy seabeds, Tenerife, Canary Islands.

INTRODUCTION

The Comesomatidae is a cosmopolitan family of free-living marine nematodes that was first established as a subfamily by FILIPJEV [3]. It is represented in most benthic faunal assemblages and has been extensively reported in sampling surveys (JENSEN [8, 9], SHARMA & WEBSTER [13], VANREUSEL *et al.* [15]).

The phylogenetic relationships of the family Comesomatidae remain unresolved because they have diagnostic morphological characteristics of the orders Monhysterida and Chromadorida. They have been assigned to the order Monhysterida by FILIPJEV [3, 4], JENSEN [8] and LORENZEN [10] since the female gonoducts are outstretched and the presence of multispiral amphids is considered to be a derived character, absent among Monhysterida.

However, because all chromadorids have multispiral amphids, WIESER [16] and HOPE & ZHANG [5] assigned Comesomatidae to the order Chromadorida. They regarded Comesomatidae as a monophyletic family, because the females of no other members of Chromadorida have outstretched gonoducts. The family Comesomatidae also have punctations and ring pores on their cuticular surface that are lacking in the Monhysterida. Further works are still needed to elucidate the order within Comesomatidae should be included (SHARMA *et al.* [13]), however, in the present study it is placed into the order Chromadorida.

The main characteristics of the family Comesomatidae are: a transversely punctated cuticle, multispiral amphids and tubular preloacal supplements, although the punctated cuticle and the preloacal supplements are lacking in some species. This family comprises three subfamilies: Sabatieriinae, Comesomatinae and Dorylaimopsinae. The first can be described as lacking the derived features of the other two subfamilies. The subfamily Comesomatinae is characterized by having elongated spicules and lacking gubernacular apophysis. The subfamily Dorylaimopsinae is defined by having the posterior part of the buccal cavity posteriorly expanded (PLATT, [11]).

To our knowledge, there are no records of Comesomatidae in the Canary Islands, thus, this is the first contribution of this family in the archipelago. In the present study we described 5 species, *Actarjania* sp. 1, *Actarjania* sp. 2 *Laimella* aff. *longicauda* Cobb, 1920, *Paramesonchium belgium* Jensen, 1976 and *Vasostoma* sp., belonging the first three to the subfamily Sabatieriinae and the last two to the subfamily Dorylaimopsinae. These species were collected during an ecological study of the intertidal and shallow subtidal sandy beds on the south coast of Tenerife.

MATERIAL AND METHODS

Samples were collected in the intertidal and shallow subtidal soft-bottoms of Los Abrigos (SE Tenerife) and Los Cristianos Bay (SW Tenerife). PVC cores of 4.5 cm of inner diameter were taken to a depth of 30 cm in the sediment. These samples were fixed with 10% formaldehyde in seawater for one day and decanted through a sieve of 63 μm mesh size, and posteriorly preserved in 70% ethanol. Specimens were mounted in glycerine gel and drawings of these were done using a camera lucida on a Leica DMLB microscope equipped with Nomarski interference contrast. All measurements are in micrometers and curves structures are measured along the arc. The study material is deposited in the collection of the Benthos Laboratory, Department of Animal Biology, University of La Laguna (DBAULL).

Abbreviations used in the text are: a, body length divided by maximum body diameter; b, body length divided by pharyngeal length; c, body length divided by tail length; c', tail length divided by anal body diameter; cbd, corresponding body diameter; s', spicule length divided by anal body diameter; %V, position of vulva as a percentage of body length from anterior.

SYSTEMATICS

Class ADENOPHOREA Chitwood, 1933

Subclass CHROMADORIA Pearse, 1942

Order CHROMADORIDA Chitwood, 1933

Suborder CHROMADORINA Filipjev, 1918

Family COMESOMATIDAE Filipjev, 1922

Genus *Actarjania* Hopper, 1967

This genus is characterized by having a cuticle ornamented with longitudinal files of dots. Buccal cavity cup-shaped, without noticeable teeth. Gubernaculum with a developed apophysis. Males with two opposed testes and females with two reflexed ovaries.

Actarjania sp. 1

(Fig. 1; Tab. 1)

Meristic data and studied material.- Cristianos subtidal: april 2001, 1 female (♀1).

Description.- Males not found.

Female: Body slender, tapering towards both ends. Head round and not set off. Cuticle ornamented with transversal punctations, lateral differentiation consists of marked files of dots. Amphids are 35% of the corresponding body diameter in width, multispiral of 2.5 rounds, located at 4 µm from the anterior end. Buccal cavity minute and conical. Inner labial setae lacking. Outer labial setae inconspicuous and 4 cephalic setae 1.8 head diameters long, situated in the anterior half of the head. Subcephalic setae 19 µm long, located at 23 µm from the anterior end. Pharynx slender and cylindrical. Ventral gland and nerve ring not seen.

The reproductive system is diorchic, with two outstretched ovaries. Vulva located at the level of the 62% of the total body length. Tail 4.7 anal diameters long, slender and with round posterior end. Postloacal setae 4 µm long, situated at 2 µm from the posterior end.

Discussion.- *Actarjania* sp. 1 can be differentiated of the remaining species of the genus in having a filiform tail in most of its length and its larger total body length. Moreover, amphids are smaller (35% of the cbd) compared to the most closely related species *Actarjania splendens* Hopper, 1967

| | ♀1 |
|------------------------|--------|
| Total body length | 1471.4 |
| a | 25.8 |
| b | 10.8 |
| c | 8.8 |
| Cephalic diameter | 17.1 |
| Outer labial setae | 31.4 |
| Subcephalic setae | 18.6 |
| Buccal cavity diameter | 7.1 |
| Amphid diameter | 10 |
| Amphid height | 10 |
| Amphid from anterior | 7.1 |
| Pharynx length | 135.7 |
| Pharynx cbd | 39.3 |
| Maximum body diameter | 57.1 |
| Vulva from anterior | 914.3 |
| % V | 62.1 |
| Tail length | 167.9 |
| Anal body diameter | 35.7 |
| c' | 4.7 |

Table 1.- Measurements of *Actarjania* sp. 1 in µm.

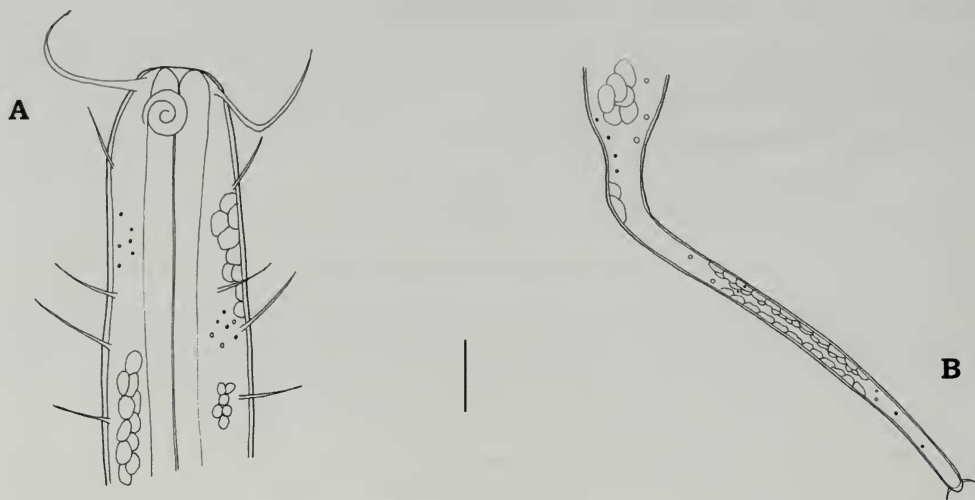


Figure 1.- *Actarjania* sp. 1. Female. A. Anterior end. B. Posterior end. Scale A = 20 μ m, B = 24 μ m.

(67% of the cbd). The determination of these individuals has been done to genus level due to the lack of males.

Sediment characteristics.- This species was recorded in fine sands ($Q_{50} = 0.18$), with a very good selection ($S_0 = 0.60$). The organic matter content was 0.71% and carbonates percentage was 26.84%.

***Actarjania* sp. 2**
(Fig. 2; Tab. 2)

Meristic data and studied material.- Abrigos subtidal: december 2000, 1 male (σ^1), march 2001, 1 juvenile (Juvenile 1).

Description.- *Male:* Body slender, attenuating on both ends. Head round and set off. Cuticle ornamented with homogeneous punctations, lateral differentiation formed by 6 longitudinal files of larger dots. Amphids are 53% of the corresponding body diameter in width, multispiral of 2.5 rounds, located at 7 μ m from the anterior end. Buccal cavity small and conical. Inner labial setae lacking. Outer labial setae 3 μ m long and 4 cephalic setae 1.7 head diameters long, located at the anterior part of the head. Subcephalic setae 16 μ m long, situated at 15 μ m from the anterior end. Pharynx slender and cylindrical. Ventral gland and nerve ring not seen.

The reproductive system is diorchis with two opposed testes. Spicules 1 anal diameter long, paired and arcuated, proximally cephalated with a terminal cuticularised knob. Gubernaculum 0.6 anal diameters long, with a enlarged, dorsocaudally directed apophysis. 11 tubular precloacal supplements compound by two cuticularised structures, arranged into

3 groups, the first one formed by 5 supplements closely together, the second group formed by 4 supplements and the third one formed by 2 larger supplements more widely spaced, being situated the posteriormost at 9 μm from the cloaca. Tail cylindrical and short, with round posterior end. 2 postcloacal setae 4 μm long, located at 11 μm from the posterior end.

Females not found.

Discussion.- *Actarjania* sp. 2 resembles *A. splendes* Hopper, 1967 by general shape of the body, amphids size and subcephalic setae arrangement. However, it differs in spicular apparatus morphology, having *A. splendes* a proximally cephalated spicule and smaller gubernaculum. *A. splendes* has 9 tubular precloacal supplements not separated in groups whilst *Actarjania* sp. 2 has 11 precloacal supplements compound by two cuticularised structures and arranged in three groups. Another related species is *Actarjania pomeroi* Boucher, 1973 but can be differentiated from *Actarjania* sp. 2 in having a smaller gubernacular apophysis and lacking a posteriormost group of precloacal supplements. Canarian specimens were determined to genus level due to the bad conditions of the collected material.

Sediment characteristics.- This species was recorded in medium sands ($Q_{50} = 0.25-0.28$), with a very good selection ($S_0 = 0.75$). The organic matter content ranged from 0.78% to 0.91% and carbonates percentage varied between 5.47% and 6.32%.

| | ♂1 | Juvenile 1 |
|----------------------------|-------|------------|
| Total body length | 2987 | 2485.7 |
| A | 34.7 | 27.9 |
| B | 15.5 | 9.7 |
| C | 31 | 11.2 |
| Cephalic diameter | 21.4 | 15.7 |
| Outer labial setae | 5.7 | — |
| Cephalic setae | 35.7 | 20 |
| Subcephalic setae | 15.7 | 10 |
| Buccal cavity diameter | 10 | 8.6 |
| Amphid diameter | 17.1 | 11 |
| Amphid height | 15 | 8.6 |
| Amphid from anterior | 7 | 8.6 |
| Pharynx length | 192.9 | 257.1 |
| Pharynx cbd | 60.7 | 67.9 |
| Maximum body diameter | 86 | 89 |
| Spicule length | 60 | |
| Gubernaculum length | 34.3 | |
| s' | 1 | |
| Tail length | 96.4 | 221.4 |
| Anal body diameter | 60.7 | 64.3 |
| c' | 1.6 | 3.4 |
| Spicule length/Tail length | 0.6 | |

Table 2.- Measurements of *Actarjania* sp. 2 in μm .

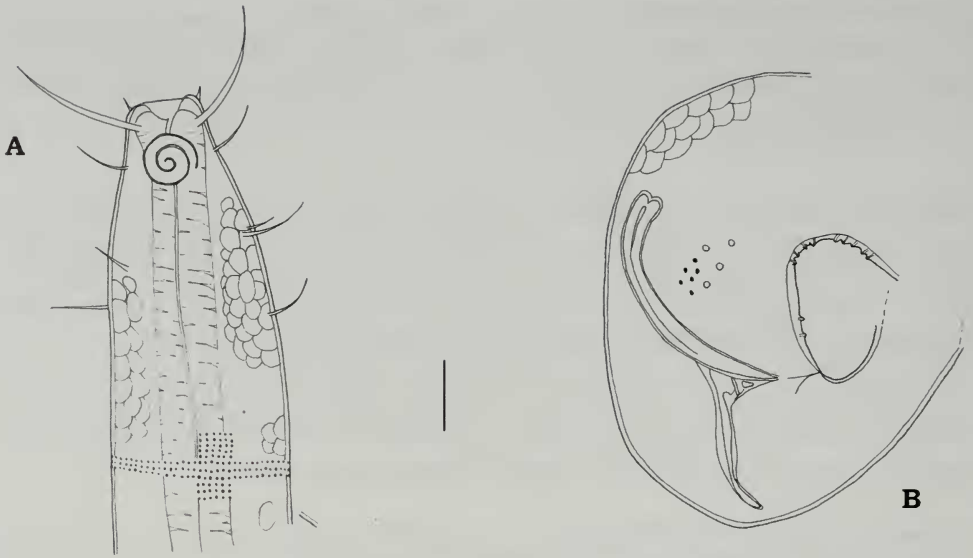


Figure 2.- *Actarjania* sp. 2. Male. A. Anterior end. B. Posterior end. Scale = 20 μ m.

Genus *Laimella* Cobb, 1920

This genus is characterized by having an annulated cuticle with striations, sometimes not discernible. Buccal cavity small and tubular with three teeth difficult to discern. Amphids multispiral with 4 or more rounds. Spicules short and heavily cuticularized. Gubernaculum with a slender apophysis. Males with two opposed and outstretched testes and females with two opposed and outstretched ovaries.

Up to now, 7 species of this genus have been described: *Laimella annae* Chen & Vincx, 2000, *L. filipjevi* Jensen, 1979, *L. longicauda* Cobb, 1920, *L. minuta* Vitiello, 1970, *L. sandrae* Chen & Vincx, 2000, *L. subterminata* Chen & Vincx, 2000 and *L. vera* Vitiello, 1971.

Laimella aff. *longicauda* Cobb, 1920

(Fig. 3; Tab. 3)

Laimella longicauda Cobb [2] 261, fig. 44; Hopper [6] 140, figs. 1-7; Chen & Vincx [1] 42, fig. 7a-e.

Laimella longicaudata.- Hopper [6] 41, fig. 13; Platt & Warwick [12] 194, fig. 85.

Meristic data and studied material.- Abrigos subtidal: october 2000, 2 juveniles (Juvenile 1 and Juvenile 2).

Description.- Males and females not found.

Juvenile: Body slender, tapering towards both ends. Head round and not set off. Cuticle smooth, without ornamentation. Amphids are 31% of the corresponding body diameter in width, multispiral of two rounds, located at 9 μ m from the anterior end. Buccal cavity un-

armed and tubular. Inner labial setae lacking. 6 outer labial setae 0.5 cephalic diameters long and 4 cephalic setae 1.5 head diameters long, situated in the median part of the head. Subcephalic setae absent. Pharynx slender and cylindrical.

Reproductive system not discernible. Tail 6.9-7.8 anal diameters long, cylindrical and filiform in most of its length, with rounded posterior tip. Caudal setae lacking. Spinneret poorly developed.

Discussion.- The most closely related species is *Laimella longicauda* Cobb, 1920 in the length of outer labial setae and tail length. However, *L. longicauda* has multispiral amphids of 3.2 rounds, subcephalic and somatic setae present, lacking in canarian specimens. The studied individuals are larger (1.8-2 mm long) than adults of *L. longicauda* (1.5-1.8 mm), and tail length are short (6.9-7.8 anal diameters) compared to *L. longicauda* (10.2-12 anal diameters) (CHEN & VINCX [1]).

Sediment characteristics.- This species was collected in fine sands ($Q_{50} = 0.24$), with a very good selection ($S_0 = 0.73$). The organic matter percentage was 0.51% and carbonates content was 4.61%.

Distribution.- Amphiatlantic (HOPPER [6], PLATT & WARWICK [12]). East Pacific ocean (CHEN & VINCX [1]). This species is first recorded in the canarian archipelago.

| | Juvenile 1 | Juvenile 2 |
|------------------------|------------|------------|
| Total body length | 1814.3 | 2071.4 |
| A | 36.3 | 32.2 |
| B | 10.8 | 9.7 |
| C | 5.4 | 5.6 |
| Cephalic diameter | 25 | 23 |
| Outer labial setae | 10 | 12 |
| Cephalic setae | 42 | 38 |
| Subcephalic setae | 15.7 | 14 |
| Buccal cavity diameter | 5.7 | 8.6 |
| Amphid diameter | 12.9 | 11.4 |
| Amphid height | 12.9 | 12.9 |
| Amphid from anterior | 9.1 | 9.2 |
| Pharynx length | 167.9 | 214.3 |
| Pharynx cbd | 39.3 | 46.4 |
| Maximum body diameter | 50 | 64.3 |
| Tail length | 335.7 | 367.9 |
| Anal body diameter | 42.9 | 53.6 |
| c' | 7.8 | 6.9 |

Table 3.- Measurements of *Laimella* aff. *longicauda* in μm .

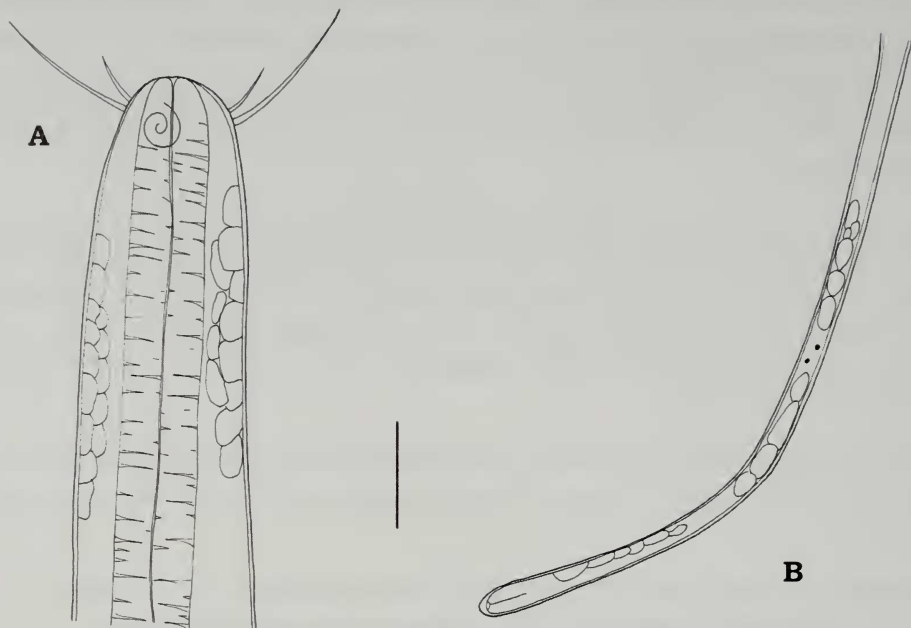


Figure 3.- *Laimella* aff. *longicauda*. Juvenil. A. Anterior end. B. Posterior end. Scale = 25 μ m.

Genus *Paramesonchium* Hopper, 1967

This genus is characterized by having an ornamented cuticle with longitudinal files of punctations. Amphids multispiral. Buccal cavity conical with three teeth. Tail cylindrical. Males with two outstretched testes and females with two outstretched ovaries.

Paramesonchium belgium Jensen, 1976

(Fig. 4; Tab. 4)

Paramesonchium belgium JENSEN [7] 244, figs. 30-37.

Meristic data and studied material.- Abrigos subtidal: october 2000, 1 juvenile (Juvenile 2), november 2000, 1 juvenile (Juvenile 4); Cristianos intertidal: november 2000, 1 juvenile (Juvenile 3); Cristianos subtidal: july 2000, 1 juvenile (Juvenile 1), november 2000, 1 juvenile (Juvenile 5).

Description.- Males and females not found.

Juvenile: Body slender, attenuating on both ends. Head not round and not set off. Cuticle punctated, without lateral differentiation. Amphids are 53% of the corresponding body diameter in width, multispiral of 3.2 rounds, located at 5 μ m from the anterior body end. Buccal cavity unarmed and tubular. Inner labial setae lacking. 6 outer labial setae 0.2 cephalic diameters long and 4 cephalic setae 2.6 head diameters long, situated in the anterior part of the

head. Subcephalic setae 8-16 μm long, located at 21-24 μm from the anterior body end. Pharynx slender and cylindrical. Ventral gland and nerve ring not seen.

Reproductive system not discernible. Tail 3.7 anal diameters long, slender and cylindrical, with round posterior end. Caudal setae 6 μm long, situated 3 μm from the posterior end. Spinneret poorly developed.

| | Juvenile 1 | Juvenile 2 | Juvenile 3 | Juvenile 4 | Juvenile 5 |
|------------------------|------------|------------|------------|------------|------------|
| Total body length | 1571.4 | 2065 | 1385.7 | 2102 | 1685.7 |
| a | 42.3 | 48.2 | 38.8 | 50 | 42.1 |
| b | 9.4 | 9.8 | 7.9 | 10 | 9.8 |
| c | 11.9 | 14.1 | 13.4 | 17.3 | 13.1 |
| Cephalic diameter | 10 | 10 | 19 | 14.3 | 18.6 |
| Outer labial setae | 2 | 2 | 2 | 2 | 2.7 |
| Cephalic setae | 31.4 | 26 | 35.7 | 38.6 | 42.9 |
| Subcephalic setae | 8.6 | 12 | 10 | 12 | 14.3 |
| Buccal cavity diameter | 6 | 5 | 4.3 | 7.1 | 8.6 |
| Amphid diameter | 5.7 | 5.7 | 7.1 | 8.6 | nd |
| Amphid height | 7.1 | 5.7 | 8.6 | 11.4 | nd |
| Amphid from anterior | 5 | 7.1 | 4.3 | 7 | nd |
| Pharynx length | 167.9 | 210.7 | 175.0 | 210.7 | 171.4 |
| Pharynx cbd | 28.6 | 21.4 | 25 | 39.3 | 39.3 |
| Maximum body diameter | 37.1 | 42.9 | 35.7 | 42 | 40 |
| Tail length | 132.1 | 146.4 | 103.6 | 121.4 | 128.6 |
| Anal body diameter | 21.4 | 39.3 | 21.4 | 42.9 | 35.7 |
| c' | 6.2 | 3.7 | 4.8 | 2.8 | 3.6 |

Table 4.- Measurements of *Paramesonchium belgium*. nd, no discernible.

Discussion.- The two species of this genus can be differentiated by the presence in *Paramesonchium belgium* Jensen, 1976 of a ring of denticles in the anterior part of the buccal cavity and caudal setae, whilst in *P. seriale* (Wieser, 1954) these two characters are lacking. Canarian specimens agreed well with *P. belgium* Jensen, 1976 due to the presence of caudal setae although the ring of denticles is inconspicuous.

Sediment characteristics.- This species was recorded in the subtidal of Los Abrigos in fine sands ($Q_{50} = 0.24$), with a very good selection ($S_0 = 0.73$). The organic matter percentage was 0.51% and carbonates content was 4.61%. In the intertidal of Los Cristianos was collected in fine sands ($Q_{50} = 0.16$), with a very good selection ($S_0 = 0.58$). The organic matter content was 0.73% and carbonates percentage was 24.96%. In the subtidal of the same locality was recorded in fine sands ($Q_{50} = 0.21$), with a very good selection ($S_0 = 0.68$). The organic matter percentage was 0.64% and carbonates content was 24.56%.

Distribution.- East Atlantic ocean (JENSEN [7]). This species is first recorded in the Canary Islands.

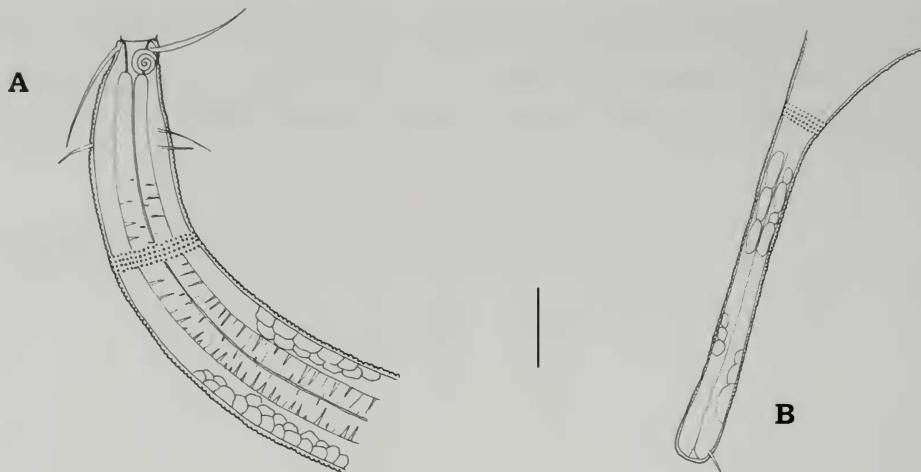


Figure 4.- *Paramesonchium belgium*. Juvenil. A. Anterior end. B. Posterior end.
Scale A = 25 μ m, B = 30 μ m.

Genus *Vasostoma* Wieser, 1954

This genus is characterized by having an ornamented cuticle with transverse punctations. Amphids multispiral. Buccal cavity expanded posteriorly and armed anteriorly with three teeth. Spicules short. Gubernaculum with developed apophysis. Males with two opposed and outstretched testes. Females with two opposed and outstretched ovaries.

Vasostoma sp.

(Fig. 5; Tab. 5)

Meristic data and studied material.- Abrigos subtidal: november 2000, 1 specimen (anterior fragment).

Description.- This species is represented by only one anterior fragment. Body slender, tapering towards both ends. Head not round and slightly set off. Cuticle ornamented with fine transversal striations. Amphids are 82% of the corresponding body diameter in width, multi-spiral of 3 rounds, located at 7 μ m from the anterior end. Buccal cavity unarmed and tubular. Inner labial setae absent. 6 outer labial setae 0.7 cephalic diameters long. 4 cephalic setae 2.1 head diameters long, situated in the median part of the head. Several rows of subcephalic setae 10 μ m long, located anteriormost at 22 μ m from the anterior end. Pharynx slender and cylindrical. Ventral gland and nerve ring not seen

Discussion.- The two species of this genus, *Vasostoma spiratum* Timm, 1961 and *V. longispiculum* Wieser, 1954 can be differentiated to the Canarian specimen in having shorter cephalic setae, amphids shape (multispiral of 3.7 rounds) and absence of subcephalic setae. This species has been determined to genus level due to the lack of material in good conditions.

| | anterior fragment |
|-----------------------|----------------------|
| Total body length | 1471.4 |
| a | 44.8 |
| b | 10.6 |
| Cephalic diameter | 13 |
| Outer labial setae | 10.0 |
| Cephalic setae | 27.1 |
| Amphid diameter | 17.1 |
| Amphid height | 18.6 |
| Amphid from anterior | 7.1 |
| Pharynx length | 139.3 |
| Pharynx cbd | 22.9 |
| Maximum body diameter | 32.9 |

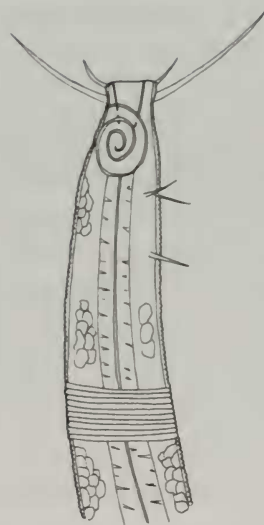


Figure 5.- *Vasostoma* sp. Anterior end.
Scale = 25 μ m.

Table 5.- Measurements of *Vasostoma* sp.
in μ m.

Sediment characteristics.- This species was recorded in fine sands ($Q_{50} = 0.24$), with a very good selection ($S_0 = 0.79$). The organic matter content was 0.77% and carbonates percentage was 9.57%.

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